

Canadian species of the *Zyras* group of genera and review of the types from America north of Mexico (Coleoptera, Staphylinidae, Aleocharinae)

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Canadian species of the *Zyras* group of genera and review of the types from America north of Mexico (Coleoptera, Staphylinidae, Aleocharinae). - A review of the Canadian species of the *Zyras* Stephens group of genera is presented including new diagnoses, distribution maps, colour habitus images and genital illustrations. Colour habitus images, genital line illustrations and a key are provided for all valid species from America north of Mexico. Nearctic *Zyras*, formerly regarded in a broad sense (*sensu lato*), is treated here in a restricted sense, and a new classification is proposed to accommodate species from the Nearctic region. Five genera are recognized: *Apalonia* Casey (1 species), *Myrmoecia* Mulsant & Rey (2 species); *Zyras* (s. str.) Stephens (3 species); *Pella* Stephens (9 species); and *Platysa* Casey (1 species) [**reinstated**]. Types of *Z. flavicornis* Solsky were not located and the species is considered as *insertae sedis* and is not included in descriptions or the key. Sixteen *Zyras*-related species are recognized in America north of Mexico, nine of which occur in Canada. Three species represent new Canadian records (NCR), four represent new provincial records (NPR) and five new state records (NSR). Four new synonymies are established, with the second name being valid: *Apalonia divisa* Casey = *A. seticornis* Casey; *Myrmedonia cremastogastris* Wasman = *Pella loricata* (Casey); *Zyras* (s. str.) *pseudohaworthi* Klimaszewski = *Z. (s. str.) obliquus* (Casey); and *Myrmedonia schwarzi* Wasman = *Z. (s. str.) planifer* (Casey).

Keywords: Aleocharinae - Canada - Coleoptera - Lomechusini - North America - Staphylinidae.

INTRODUCTION

We report on *Zyras*-related genera and species that have been previously or newly recorded in Canada and provide for the first time colour habitus images and line genital illustrations for all but one species (*Z. flavicornis* Solsky) recorded from

America north of Mexico. The latter species was not found in the collection of the St. Petersburg Zoological Institute and is presumably missing. The images and illustrations are based primarily on the type specimens. The genus *Zyras* is treated here in a narrow sense with a new subdivision of American species into five newly defined genera, similar to the classification proposed by Maruyama (unpublished) and Kistner (1971). Lohse (1974) treated some of these genera as subgeneric taxa. Seevers (1978) predicted the generic subdivision of Nearctic *Zyras* (sensu lato) that will in the future include transfer of many species to the genus *Pella*. Seevers (1978) considered Nearctic *Zyras* in a broad sense, with the exception of the genera *Apalonia* and *Myrmoecia*. He also provided a key to twelve Nearctic species. The genera are here better defined using genital characters in addition to the external characteristics. Moore & Legner (1975) recorded nineteen Nearctic *Zyras* (sensu lato) species classified in four subgenera. Kistner (1971) treated at least some of the subgenera recognized by Lohse (1974) as distinct genera (e.g. *Pella*). This contribution is aimed at the basic need of providing tools for species identification and their classification. The knowledge of the Canadian species was very fragmentary and the recent catalogue by Campbell & Davies (1991) indicated the presence of only two species: "*Z*". *criddlei* and "*Z*". *loricatus*. We have discovered nine formerly described Nearctic species occurring in Canada, including three species representing new country records, four representing new provincial records and four representing new state records in the United States of America.

MATERIAL AND METHODS

Over 140 specimens of *Zyras* and related genera were examined from America north of Mexico including those from Canada. All types and the great majority of non-type specimens were dissected, and the genital structures dehydrated in absolute alcohol, transferred to xylene, mounted in Canada balsam on celluloid microslides, and pinned with the specimens from which they originated. Drawings of the genital structures were made by tracing photographs obtained from an image processing system (Nikon SMZ800 microscope, Nikon digital camera Coolpix 950, ScanDisc and Adobe Photoshop software) that were subsequently inked on Dupont Mylar[®] tracing film. Separate pictures of antenna, head, pronotum, elytra and abdomen were taken, cleaned in Adobe Photoshop to remove large pieces of dirt and defects by patching the defected areas with undefective patches from symmetrical areas and then producing the entire picture of beetles by combining the body parts together in different layers. The dorsal and lateral external images of *Z. obliquus* were taken through a Nikon SMZ-U stereomicroscope with a ProgRes 3012 digital camera set at a resolution of 3856 X 2900 pixels. Image sets of 15 scans were taken of the specimen at various focal planes. These image sets were then processed through AutoMontage V3.04 software to produce a completely in-focus image. Further enhancing and cleaning of the images were carried out with Adobe Photoshop software.

Terminology mainly follows that used by Seevers (1978), Klimaszewski (1984), Naomi (1987), Klimaszewski & Winchester (2002) and Ashe (2001). The ventral part of the median lobe of the aedeagus is considered that with the foramen

mediale of the bulbus with *ductus ejaculatorius* and the opposite side is considered as the dorsal part.

CONVENTIONS

Localities and specimen data. All information related to the material examined is provided separately (Appendix 1). Canadian localities are listed under province or territory. Additional data on the specimens examined from the United States are also included in a separate paragraph whenever appropriate (Appendix 1).

Abbreviations of the collections used in the text are: **AFC**: Natural Resources Canada, Canadian Forest Service, Atlantic Forestry Centre, Fredericton, New Brunswick, Canada. **CMC**: Christopher Majka collection, Halifax, Nova Scotia, Canada. **CNC**: Canadian National Collection of Insects, Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada. **CMNH**: The Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, United States. **LFC**: Natural Resources Canada, Canadian Forest Service, Laurentian Forestry Centre, Sainte-Foy, Quebec, Canada. **MHNG**: Muséum d'histoire naturelle, Genève, Switzerland. **NMM**: Natuurhistorisch Museum Maastricht, Maastricht, the Netherlands. **SEM**: Snow Entomological Museum, The University of Kansas, Lawrence, Kansas, United States. **UBC**: University of British Columbia, Vancouver, British Columbia, Canada. **USNM**: Smithsonian Institution, United States National Museum of Natural History, Washington, District of Columbia, United States.

SYSTEMATICS

Tribe **LOMECHUSINI** Fleming, 1821

Lomechusini Fleming, 1821: 49. Type genus: *Lomechusa* Gravenhorst, 1806.
(=**Myrmedoniini** Thomson, 1867, see Newton & Thayer, 1992)
(=**Zyrasini** Bradley, 1930)

DIAGNOSIS

Adults. Many genera and species are associated with ants (Seevers, 1978; Ashe, 2001). Tarsi 4,5,5-segmented; galea and lacinia moderately to greatly elongate; maxillary sinuses usually extensive (Seevers, 1978); ligula bifid (Seevers, 1978) or short and rounded at apex; mesocoxae set in marginal acetabula, and moderately to broadly separated (Figs 64-72); metasternal process usually broad and distinctly longer than short mesosternal process (Figs 64-72); isthmus long, short or completely reduced (Figs 64-72); metacoxae transverse; bulbus of the median lobe of the aedeagus usually with obliquely subdivided posterior part (Seevers, 1978).

SPECIES CHECKLIST OF ZYRAS AND RELATED GENERA IN AMERICA NORTH OF MEXICO

Conventions: species are listed in alphabetical order, synonyms are in small font; the states and provinces in bold represent the new records; species names in bold indicate presence in Canada.

Genus *Apalonia* Casey, 1906

1. *Apalonia seticornis* Casey, 1906: 323; Seevers, 1978: 154. As *Zyras*: Bernhauer & Scheerpeltz, 1926: 704. As *Zyras (Apalonia)*: Moore & Legner, 1975: 508 (UNITED STATES OF AMERICA: Florida).

Apalonia divisa Casey, 1911: 75. As *Zyras*: Bernhauer & Scheerpeltz, 1926: 697. As *Zyras (Apalonia)*: Moore & Legner, 1975: 507 (UNITED STATES OF AMERICA: Kansas). **New synonymy.**

Genus *Myrmoecia* Mulsant & Rey, 1874

2. *Myrmoecia lauta* (Casey, 1893: 327), (*Nototaphra*). As *Zyras*: Bernhauer & Scheerpeltz, 1926: 700. As *Myrmoecia*: Seevers, 1978: 154. As *Zyras (Myrmoecia)*: Moore & Legner, 1975: 508 (**CANADA: Ontario**; UNITED STATES OF AMERICA: Massachusetts, **Maine**, Michigan, New Hampshire, New York).

Myrmoecia picta Wasmann, 1894: 206. As synonym of *Z. lauta*: Bernhauer & Scheerpeltz, 1926: 700; Moore & Legner, 1975: 508. **Synonymy confirmed.**

3. *Myrmoecia lugubris* (Casey, 1893: 327), (*Nototaphra*). As *Zyras*: Bernhauer & Scheerpeltz, 1926: 701. As *Myrmoecia*: Seevers, 1978: 154. As *Zyras (Myrmoecia)*: Moore & Legner, 1975: 508 (**CANADA: British Columbia** [Seevers, 1978]; UNITED STATES OF AMERICA: Colorado).

Genus *Zyras* (s. str.) Stephens, 1835 [restricted]

4. *Zyras* (s. str.) *obliquus* (Casey, 1893: 322), (*Myrmedonia*); Bernhauer & Scheerpeltz, 1926: 702; Moore & Legner, 1975: 508; Klimaszewski & Peck, 1986: 87 [reinstated]. As synonym of *Z. haworthi* (Stephens): Seevers, 1978: 154. (**CANADA: Alberta, Manitoba, Ontario, Quebec**, British Columbia; UNITED STATES OF AMERICA: Michigan, Missouri, **New Hampshire**, New York, Oregon).

Zyras pseudohaworthi Klimaszewski, in: Klimaszewski & Winchester, 2002: 53. **New synonymy.**

5. *Zyras* (s. str.) *planifer* (Casey, 1893: 322), (*Myrmedonia*); Bernhauer & Scheerpeltz, 1926: 703; Seevers, 1978: 153. As *Zyras (Platyusa)*: Moore & Legner, 1975: 508 (UNITED STATES OF AMERICA: Indiana, North Carolina).

Myrmedonia schwarzi Wasmann, 1894: 207; Bernhauer & Scheerpeltz, 1926: 704; Seevers, 1978: 153; Moore & Legner, 1975: 508 (UNITED STATES OF AMERICA: Washington D.C.). **New synonymy.**

6. *Zyras* (s. str.) *rudis* (Leconte, 1866: 372), (*Myrmedonia*); Bernhauer & Scheerpeltz, 1926: 704; Seevers, 1978: 153. As *Myrmedonia* Erichson: Casey, 1893: 322. As *Zyras (Platyusa)*: Moore & Legner, 1975: 508 (UNITED STATES OF AMERICA: **Arizona**, Washington, D.C.).

Genus *Pella* Stephens, 1835

7. *Pella angustula* (Casey, 1893: 322), (*Myrmedonia*). As *Zyras*: Bernhauer & Scheerpeltz, 1926: 695; Seevers, 1978: 154. As *Zyras (Apalonia)*: Moore & Legner, 1975: 507 (UNITED STATES OF AMERICA: Florida).
8. *Pella caliginosa* (Casey, 1893: 322), (*Myrmedonia*). As *Zyras*: Bernhauer & Scheerpeltz, 1926: 695; Seevers, 1978: 154. As *Zyras (Platyusa)*: Moore & Legner, 1975: 507 (UNITED STATES OF AMERICA: Indiana, New York).

9. *Pella carolinae* (Casey, 1911: 72), (*Myrmedonia*). As *Zyras*: Bernhauer & Scheerpeltz, 1926: 696. As *Zyras (Platyusa)*: Moore & Legner, 1975: 507 (**CANADA: Ontario**; UNITED STATES OF AMERICA: North Carolina).
10. *Pella criddlei* (Casey, 1911: 73), (*Myrmedonia*). As *Zyras*: Bernhauer & Scheerpeltz, 1926: 697. As *Zyras (Platyusa)*: Moore & Legner, 1975: 507, Campbell & Davies, 1991: 106 (**CANADA: Alberta, Manitoba, Quebec**).
11. *Pella fauveli* (Sharp, 1883: 199), (*Myrmedonia*). As *Zyras*: Bernhauer & Scheerpeltz, 1926: 698; Seevers, 1978: 154. As *Zyras (Apalonia)*: Moore & Legner, 1975: 507 (UNITED STATES OF AMERICA: California, Louisiana, Texas; **MEXICO: Baja California**, Mexico City).
12. *Pella gesneri* Klimaszewski in: Klimaszewski *et al.* (2005: 29): (**CANADA: Alberta, Manitoba, New Brunswick, Ontario**).
13. *Pella recisa* (Casey, 1911: 74), (*Myrmedonia*). As *Zyras*: Bernhauer & Scheerpeltz, 1926: 703; Seevers, 1978: 154. As *Zyras (Apalonia)*: Moore & Legner, 1975: 508 (UNITED STATES OF AMERICA: Pennsylvania).
14. *Pella loricata* (Casey, 1893: 322), (*Myrmedonia*). As *Zyras*: Bernhauer & Scheerpeltz, 1926: 701, Seevers, 1978: 154. As *Zyras (Platyusa)*: Moore & Legner, 1975: 508; Campbell & Davies, 1991: 106 (**CANADA: Ontario**; UNITED STATES OF AMERICA: Ohio).

Myrmedonia cremastrogastris Wasmann 1894: 207. **New synonymy.**

15. *Pella schmitti* (Hamilton, 1895: 346), (*Myrmedonia*). As *Zyras*: Bernhauer & Scheerpeltz, 1926: 704, Seevers, 1978: 153. As *Zyras (s. str.)*: Moore & Legner, 1975: 508 (**CANADA: Ontario, Quebec**; UNITED STATES OF AMERICA: **Massachusetts**, Pennsylvania).

Genus *Platyusa* Casey, 1885 [**reinstated**]

16. *Platyusa sonomae* Casey, 1885: 305. As *Myrmedonia* Erichson: Casey, 1893: 322. As *Zyras*: Bernhauer & Scheerpeltz, 1926: 705, Seevers, 1978: 153. As *Zyras (Platyusa)*: Moore & Legner, 1975: 508 (**CANADA: Ontario**; UNITED STATES OF AMERICA: **Arizona, California**, Ohio).

Species insertae sedis

17. *Zyras flavicornis* Solsky, 1870: 285. Type specimens not located. Specimens not found in the collection of the St. Petersburg Institute, Russia, where Solsky's collection is housed.

KEY TO SPECIES OF ZYRAS GROUP OF GENERA IN AMERICA NORTH OF MEXICO

(Species occurring in Canada are indicated in bold, not all characters are examined for taxa outside Nearctic region)

- 1 Head at eye level subequal to pronotum and about as broad as elytra (Fig. 3); abdomen strongly swollen laterally, widest at six and seven segments, and with numerous extremely elongate macrosetae (Fig. 3); mesosternum (Fig. 64), and genitalia as illustrated (Figs 19, 20), (**APALONIA**) *Apalonia seticornis* Casey

- Head narrower than pronotum and elytra (Figs 4-18); abdomen at most slightly swollen laterally, and usually subparallel or tapering posteriorly, and without pronounced macrosetae (Figs 4-18); mesosternum and genitalia differently shaped 2
- 2 Abdominal second and third visible tergites with large tuberosities (better visible in lateral view) (Fig. 5); antennal segments 4-10 appearing somewhat bead-shaped (Figs 4, 5); forebody with short, strongly adhering to integument, pubescence (Figs 4, 5); mesosternum with a very short isthmus (Fig. 65); genitalia as illustrated (Figs 21-24), (*MYRMOECIA*) 3
- Abdominal second and third visible tergites without tuberosities; antennal segments variable in shape but do not appear bead-shaped; pubescence less adhering to integument and well defined or nearly missing; mesosterna as illustrated (Figs 66-72); genitalia differently shaped 4
- 3 Body bicoloured, head, elytra and apical part of abdomen dark brown and appendages, pronotum and basal part of abdomen yellowish-brown (Fig. 4), genitalia as illustrated (Figs 21-23) . *Myrmoecia lauta* (Casey) (p. 710)
- Body, except for reddish appendages, central part of elytra and apical abdomen uniformly dark brown (Fig. 5); male unknown, spermatheca as illustrated (Fig. 24) *Myrmoecia lugubris* (Casey) (p. 712)
- 4 Pronotum as broad as elytra, rounded laterally and broadest in the middle (Fig. 16); mesocoxae narrowly separated and isthmus long (Fig. 70); genitalia as illustrated (Figs 52-54) (*PLATYUSA*). *Platyusa sonomae* Casey (p. 729)
- Pronotum distinctly narrower than elytra and usually broadest in apical third (Figs 6-14, 17); mesocoxae broadly separated and isthmus absent to short (Figs 66-69, 71); genitalia differently shaped 5
- 5 Body strongly glossy, punctation on forebody sparse and coarse (Figs 6-8), pronotum with well-defined median antebasal fovea, with arcuate lateral margins, broadest slightly above the middle, and about two thirds as broad as long (Figs 1, 2, 6-8), elytra with flanged sutural groove on inner lateral side of each elytron, going from scutellum to the apical margin of each elytron (*ZYRAS*) 6
- Body from moderately glossy to rarely opaque, punctation on forebody fine and dense (Figs 9-15); pronotum lacking median antebasal fovea, usually trapezoidal in shape, broadest usually in apical third (Figs 9-15), elytra without flanged sutural groove (*PELLA*) 8
- 6 Pronotum dark brown to nearly black (Figs 1, 2, 6); antennal segments 7-10 slightly transverse (Figs 1, 2, 6); genital structures as illustrated (Figs 31-35) *Zyras* (s. str.) *obliquus* (Casey) (p. 714)
- Pronotum yellowish or reddish (Figs 7, 8); antennal segments 7-10 strongly transverse (Figs 7, 8); genitalia differently shaped (Figs 25-29) 7
- 7 Body yellowish with brown head, posterior elytra and apical part of abdomen (Fig. 8); forebody with extremely coarse punctation (Fig. 8); genital structures as illustrated (Figs 27-29)
..... *Zyras* (s. str.) *rudis* (Leconte)

- Body reddish to reddish-brown with dark brown apical portion of abdomen (Fig. 7); forebody with moderately coarse punctation (Fig. 7); genital structures as illustrated (Figs 25, 26)
..... *Zyras* (s. str.) *planifer* (Casey)
- 8 Body extremely broad, pronotum slightly broader than elytra and broadest at basal third of the disc (Fig. 18); antennal segments 6-10 strongly transverse and about twice wider than long (Fig. 18); meso-sternum (Fig. 72); genitalia as illustrated (Figs 57-59)
..... *Pella schmitti* (Hamilton) (p. 722)
- Body narrowly elongate, pronotum usually distinctly narrower than elytra and broadest at apical third or at the middle of the disc (Figs 6-15, 17); antennal segments 6-10 usually less strongly transverse; genitalia differently shaped 9
- 9 Pronotum approximately shield-shaped, nearly as broad as elytra, lateral margins approximately evenly arcuate (Figs 10, 12) 10
- Pronotum trapezoidal in form, distinctly narrower than elytra, lateral margins unevenly arcuate (Figs 9, 11, 13-15) 11
- 10 Body predominantly dark brown with yellowish median part of elytra, pronotum with width/length ratio 1.3 (Fig. 10); antennal segments 7-10 about twice wider than long (Fig. 10); genitalia as illustrated (Figs 38-40) *Pella caliginosa* (Casey)
- Body predominantly reddish-brown with reddish base of elytra, pronotum with width/length ratio 1.4 (Fig. 12); antennal segments 7-10 slightly transverse (Fig. 12); genitalia as illustrated (Figs 44-46)
..... *Pella gesneri* Klimaszewski (p. 718)
- 11 Integument strongly opaque with dense punctation on forebody (Fig. 17); isthmus long (Fig. 71); genitalia as illustrated (Figs 55, 56, 60)
..... *Pella criddlei* (Casey) (p. 721)
- Integument never opaque, moderately to strongly glossy with sparse to moderately dense punctation (Figs 6-15); isthmus short to slightly elongate (Figs 66-69); genitalia differently formed 12
- 12 Body bicoloured, yellowish-light brown (Fig. 11); genitalia as illustrated (Figs 41-43) *Pella fauveli* (Sharp)
- Body approximately uniformly brown (Figs 9, 13-15) 13
- 13 Pronotum strongly transverse, about one third broader than long (Fig. 13); male unknown; spermatheca as illustrated (Fig. 51)
..... *Pella recisa* (Casey)
- Pronotum slightly transverse, about one fourth to one sixth broader than long (Figs 9, 14, 15); body length, with exception of *P. angustula*, greater than 3.0 mm; genitalia differently shaped (Figs 30, 47-50) 14
- 14 Forebody slim, pronotum about one sixth broader than long (Fig. 9); male unknown; spermatheca (Fig. 30) *Pella angustula* (Casey)
- Forebody moderately robust, pronotum about one fifth broader than long (Figs 14, 15); genitalia as illustrated (Figs 47-50, 61-63) 15

- 15 Spermathecal stem moderately elongate and strongly swollen posteriorly (Figs 47, 63); apex of male tergite eight with strong serration (Fig. 62); median lobe of aedeagus as illustrated (Fig. 61)
 *Pella carolinae* (Casey) (p. 719)
- Spermathecal stem strongly elongate and slightly enlarged posteriorly (Fig. 50); apex of male tergite eight with scarcely visible serration (Fig. 49); median lobe of aedeagus as illustrated (Fig. 48)
 *Pella loricata* (Casey) (p. 721)

THE CANADIAN SPECIES

Note. Detailed list of specimens examined, see Appendix 1. The states and provinces in bold represent the new records.

I. Genus *Myrmoecia* Mulsant & Rey

Figs 4, 5, 21-24, 65

Myrmoecia Mulsant & Rey, 1874: 130; Seevers, 1978: 154. **Type species:** *Myrmoecia tuberventris* (Fairmaire), (*Myrmedonia*). Fixed by Deyrolle, 1874: 396, by subsequent designation. **Species included:** *Z. lauta* (Casey), *Z. lugubris* (Casey).

DIAGNOSIS

Body medium-sized, moderately robust, moderately glossy, slightly flattened, pubescence fine and strongly adhering to the integument and with somewhat silky appearance; antenna with basal segment as long as the two following segments combined, second segment smaller than third, 4-10 appearing somewhat bead-shaped and the terminal segment about as long as the two preceding segments combined; head strongly flattened medially; pronotum impressed medially, broadest in apical third, about one fourth broader than long and about one fourth narrower than elytra, punctuation fine, pubescence directed obliquely posterad along arcuate lines on both sides of the disc and inwards at the basal margin of the disc; abdominal first visible tergite two and three (= actual four and five) bearing large tuberosities (Fig. 5), paratergites strongly elevated dorsally; median lobe of aedeagus simple with moderately sized bulbous and narrowly elongate tubus (Fig. 21); spermatheca with short and broadening apically capsule bearing broadly conical invagination, stem strongly sinuate and long (Figs 23, 24).

1. *Myrmoecia lauta* (Casey)

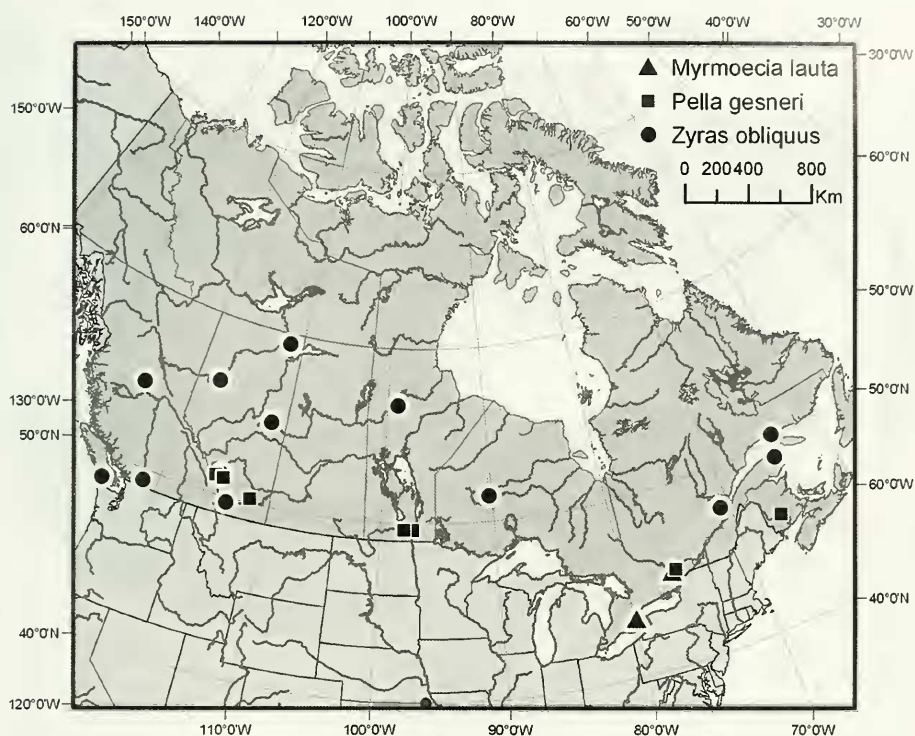
Map 1, Figs 4, 21-23, 65

Nototaphra lauta Casey, 1893: 327. **Holotype** (female, in original description misidentified as a male): USA, New York, Type USNM 39407 (USNM/SEM). **Non-type material:** Appendix 1.

Myrmoecia picta Wasmann, 1894: 206. **Syntype** (male): USA, Massachusetts, Blanchard (NMM). **Synonymy confirmed.**

DIAGNOSIS

Body length 2.8-3.0 mm; narrowly elongate, head, elytra and posterior part of abdomen (segments V-X) dark brown and remainder of the body orange-yellow with reddish tinge, antennae orange-brown (Fig. 4); forebody with distinct meshed microsculpture; pubescence short and moderately dense; pronotum broadly impressed medially and approximately trapezoidal in shape, distinctly narrower than elytra,



MAP 1

Collection localities in Canada of *Myrmoecia lauta*, *Pella gesneri*, and *Zyrras obliquus*.

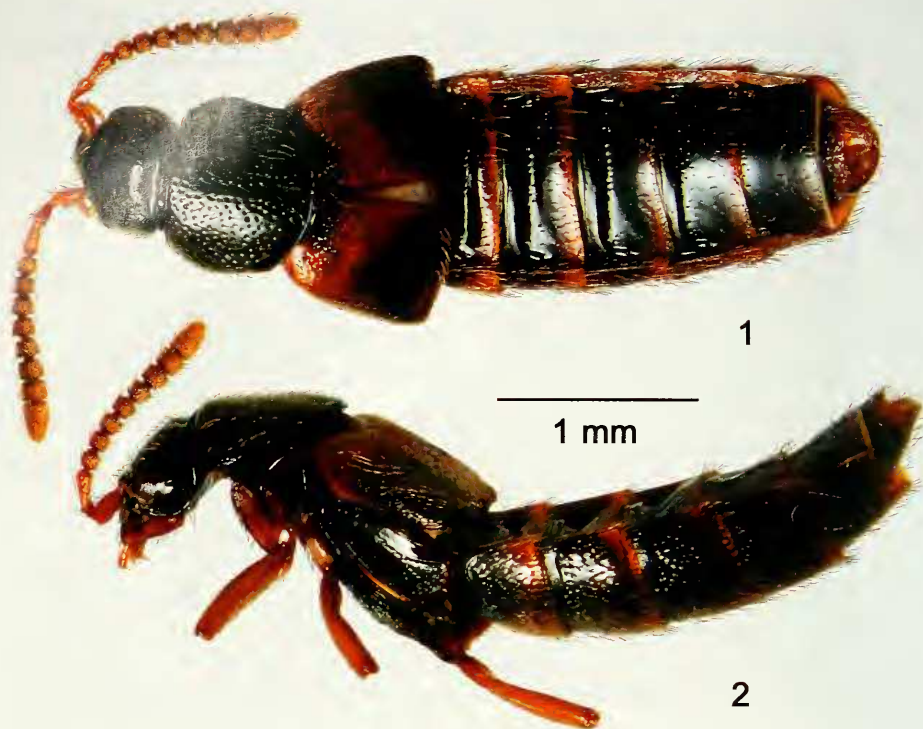
width/length ratio 1.33 (Fig. 4); elytra about twice as broad as the suture, elytra/pronotum length ratio 1.3 (Fig. 4); basal segment of metatarsus as long as the two following segments combined. MALE. Tergite eight slightly transverse, antecostal suture straight medially and slightly sinuate laterally, truncate apically; sternite eight slightly transverse, antecostal suture sinuate, apical margin broadly arcuate. Median lobe of aedeagus with small bulbus and moderately elongate and subparallel dorsally tubus, internal sac structures not apparent (Fig. 21). FEMALE. Tergite and sternite eight similar to those of a male; spermatheca with short tubular and slightly broadening apically capsule bearing broadly conical invagination, stem strongly sinuate anteriorly and posteriorly (Fig. 23).

BIONOMICS

Some specimens were captured in July (Ontario) and November (Maine). One Ontario specimen was found in alvar habitat.

GEOGRAPHIC DISTRIBUTION (Map 1).

CANADA: Ontario; **UNITED STATES OF AMERICA:** Massachusetts, Maine, Michigan, New Hampshire, New York.



Figs 1-2

Zyras (s. str.) *obliquus* Casey, in dorsal and lateral view.

2. *Myrmoecia lugubris* (Casey)

Figs 5, 24

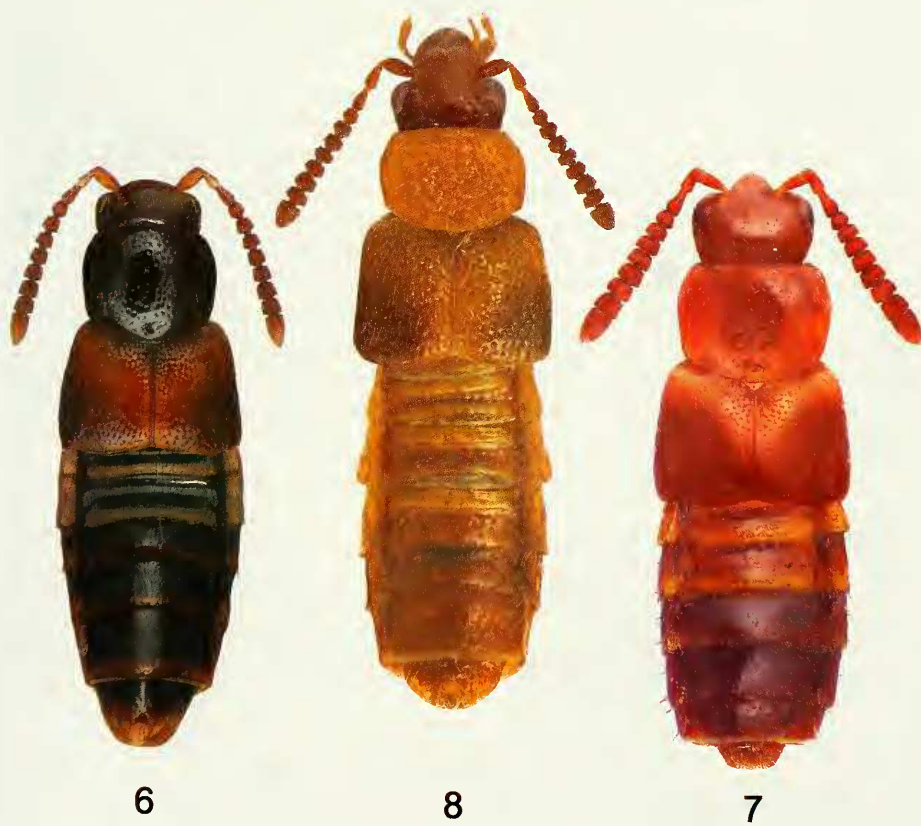
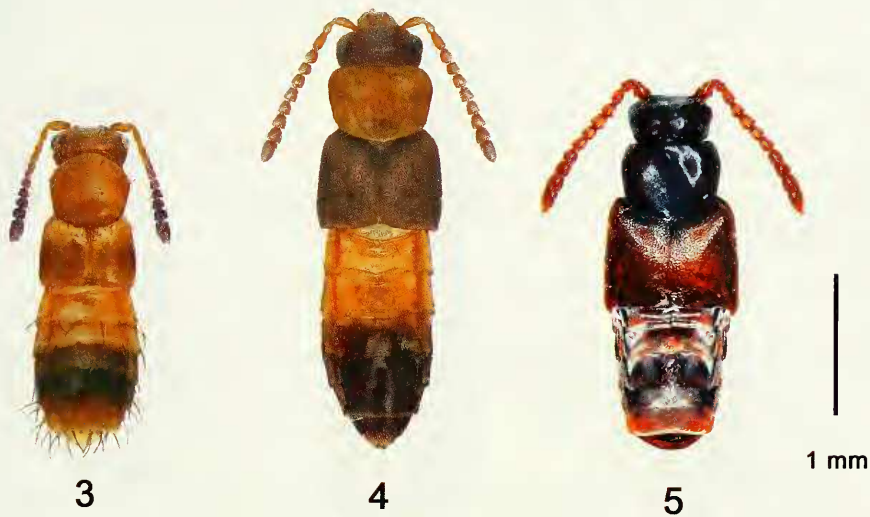
Nototaphra lugubris Casey 1893: 327. **Holotype** (female): USA, Colorado, La Veta 4, 7; Type USNM 39408 (USNM/SEM).

DIAGNOSIS

Body length 2.5 mm; narrowly elongate, head, pronotum, baso-lateral part of elytra and nearly entire abdomen dark brown, tibiae, tarsi, antennae and maxillary palps reddish-brown (Fig. 5); forebody with distinct meshed microsculpture; pubescence short and moderately dense; pronotum broadly impressed medially and approximately trapezoidal in shape, distinctly narrower than elytra, width/length ratio 1.2 (Fig. 5); elytra slightly less than twice as broad as the suture, elytra/pronotum length ratio 1.4 (Fig. 5); basal segment of metatarsus less than three fourths as long as the two following segments combined. MALE. Unknown. FEMALE. Tergite eight strongly transverse, antecostal suture approximately straight, apex truncate; sternite

Figs 3-8

3, *Apalonia seticornis* Casey; 4, *Myrmoecia lauta* (Casey); 5, *Myrmoecia lugubris* (Casey); 6, *Zyras* (s. str.) *obliquus* (Casey); 7, *Zyras* (s. str.) *planifer* (Casey); 8, *Zyras* (s. str.) *rudis* (LeConte).



eight strongly transverse, antecostal suture slightly sinuate, apex slightly pointed; spermatheca with short, tubular and slightly broadening apically capsule bearing broadly conical invagination, stem sinuate anteriorly and posteriorly (Fig. 24).

BIONOMICS

Unknown.

GEOGRAPHIC DISTRIBUTION

CANADA: British Columbia [Seevers, 1978]; UNITED STATES OF AMERICA: Colorado.

II. Genus *Zyras* (s. str.) Stephens (**restricted definition**)

Figs 1, 2, 6-8, 25-29, 31-37, 66

Zyras Stephens, 1835: 430. **Type species:** *Zyras haworthi* (Stephens), (*Aleochara*). Fixed by Stephens, (1835) by monotypy. **Species included:** *Z. obliquus* (Casey), *Z. planifer* (Casey), *Z. rudis* (Leconte).

DIAGNOSIS

Body medium to large-sized, robust, strongly glossy and often with bright contrasting colours, moderately convex, punctuation usually large and coarse (Figs 1, 2, 6-8); pubescence fine and slightly or not adhering to the integument and without silky appearance; antenna with basal segment as long as the two following segments combined, second segment smaller than third, four slightly transverse, 5-10 moderately to strongly transverse and more so toward the apex, and the terminal segment as long as the one and a half to about two preceding segments combined (Figs 1, 2, 6-8); head moderately convex; pronotum impressed basally and usually bearing well-defined medial antebasal fovea, broadest in apical third, usually about one fourth broader than long and about one fourth narrower than elytra, punctuation moderately large to large, pubescence directed obliquely posterad along arcuate lines on both sides of the disc (Figs 1, 2, 6-8); abdominal first visible tergite two and three (= actual four and five) without tuberosities; median lobe of aedeagus with enlarged bulbus and narrowly conical tubus (Figs 25, 27, 31-33); spermatheca very small with narrowly elongate capsule and without apparent invagination, stem short connected to multiply coiled seminal canal forming a bundle (Figs 29, 35).

For larva of European species, see Topp (1978).

3. *Zyras* (s. str.) *obliquus* (Casey)

Map 1, Figs 1, 2, 6, 31-36

Myrmedonia obliqua Casey, 1893: 322. **Lectotype** (female): USA, New York, Type USNM 39403 (USNM/SEM). Designated by Klimaszewski & Peck, 1986.

Zyras pseudohaworthi Klimaszewski, in: Klimaszewski & Winchester, 2002: 53. **Holotype** (female): CANADA, British Columbia, Upper Carmanah Valley, UTM: 10U CJ 803006, 16.07-30.07.1991, TZ.MT5, N. Winchester (LFC). **New synonymy.**

FIGS 9-14

9. *Pella angustula* (Casey); 10. *Pella caliginosa* (Casey); 11. *Pella fauveli* (Sharp); 12. *Pella gesneri* Klimaszewski; 13. *Pella recisa* (Casey); 14. *Pella carolinae* (Casey).



9



10



11



1 mm



12



13



14

DIAGNOSIS

Body length 4.0-6.5 mm; narrowly elongate; head pronotum and abdomen, except for its reddish-brown margins, dark brown to black, elytra bicoloured, reddish-brown with dark brown to black base and lateral parts, appendages reddish-brown (Figs 1, 2, 6, 31-36); strongly glossy and without distinct meshed microsculpture; pubescence moderately long and sparse; antenna with basal segment about as long as the two following segments combined, second segment smaller than third, four quadrate, 5-10 moderately transverse and slightly more so toward the apex, and the terminal segment about as long as the two preceding segments combined (Figs 1, 2, 6); pronotum approximately trapezoidal in shape, bearing small basal impression, distinctly narrower than elytra (Figs 1, 2, 6); elytra about twice as broad as the suture; basal segment of metatarsus slightly longer than the two following segments combined. MALE. Tergite eight slightly notched medially and with two apical rounded projections that are close together (Fig. 34); sternite eight broadly rounded apically; median lobe of aedeagus with enlarged bulbus and conical median lobe in dorsal view, internal sac with two narrowly elongate subparallel structures (Figs 31-33). FEMALE. Tergite eight truncate apically; sternite eight truncate apically and bearing minute emargination; spermatheca small, narrow, arcuate and with subapical constriction (Figs 35, 36).

BIONOMICS

Adults were captured in 3-5-year-old post-harvest Douglas-fir forest, transition zone of Sitka spruce forest, mixed *Populus/Salix/Alnus* forest, and *Pinus banksiana* forest, by means of pitfall traps, window traps, and pan-traps. Collecting period: June through August.

GEOGRAPHIC DISTRIBUTION (Map 1).

CANADA: **Alberta, Manitoba, Ontario, Quebec**, British Columbia; UNITED STATES OF AMERICA: Michigan, Missouri, **New Hampshire**, New York, Oregon.

COMMENTS

Zyras obliquus was considered in the past as a synonym of a Palearctic species: *Z. haworthi* Stephens (Seevers 1978). It was proved, however, that the Palearctic species represented a different but closely related taxon (Klimaszewski & Winchester 2002). For a discussion on the differences between the two species, see Klimaszewski & Winchester (2002). The latter authors overlooked that there is a Casey name available, *M. obliqua*, and proposed a new name *Z. pseudohaworthi*, which is synonymized here with the Casey species.

III. Genus *Pella* Stephens

Figs 9-15, 30, 38-51, 61-63, 67-69

Pella Stephens 1835: 434. **Type species:** *Pella limbata* (Paykull), (*Staphylinus*). Fixed by Westwood (1838) by subsequent designation. **Species included:** *P. angustula*, *P. caliginosa* (Casey), *P. carolinae* (Casey), *P. criddlei* (Casey), *P. fauveli* (Sharp), *P. gesneri* Klimaszewski, *P. loricata* (Casey), *P. recisa* (Casey) and *P. schmitti* (Hamilton).

Figs 15-18

15, *Pella loricata* (Casey); 16, *Platyusa sonomae* Casey; 17, *Pella criddlei* (Casey); 18, *Pella schmitti* (Hamilton).



15



17



16



18

DIAGNOSIS

Body medium to large-sized, moderately robust to robust, usually moderately glossy to rarely opaque (Fig. 17), moderately convex (Figs 9-15, 17, 18); pubescence fine and adhering or not to the integument and without silky appearance; antenna with basal segment about as long as the two following segments combined, second segment smaller than third, four and five quadrate to slightly elongate, 6-10 slightly (Figs 9, 11-15) to strongly (Figs 10, 18) transverse and more so toward the apex, and the terminal segment about as long as the two preceding segments combined; head almost circular in dorsal view, moderately convex with occipital suture present (Naomi 1987); pronotum usually trapezoidal in form (Figs 9, 11, 13-15, 17) but exceptionally broadly oval (Fig. 18), not or slightly impressed basally, from about 1.1 (Figs 9, 11, 13-15, 17) to 1.4 (Figs 10, 12) and exceptionally to 1.8-2.0 (Fig. 18) as broad as long, usually narrower than elytra with exception of *P. schmitti* (Fig. 18), anterolateral margins of pronotal disc visible dorsally, punctation fine to moderately large, pubescence directed obliquely posterad along arcuate lines on both sides of the disc and near horizontally at the base of the disc; abdominal first visible tergite two and three (= actual four and five) without tuberosities; median lobe of aedeagus simplified, pear-shaped or oval in dorsal view, with moderately sized bulbus and tubus about subparallel to triangularly elongate (Figs 38, 41, 44, 48, 55, 57, 61); spermatheca: the *Gesneri* group – capsule narrowly elongate, sac-shaped, bearing ribbing-like microsculpture, without apparent invagination, and with a narrow stem, moderately long, sinuate, and often irregularly twisted posteriorly (Figs 30, 40, 43, 46, 51); the *Carolinae* group – capsule narrowed basally and swollen posteriorly, somewhat club-shaped, and with stem long, narrow, sinuate and bearing more or less swollen apex (Figs 47, 50, 63); the *Criddlei* group – capsule tubularly elongate bearing apical spine-like projection and short, approximately straight stem (Fig. 60); and the *Schmitti* group – capsule tubular, U-formed and stem sinuate anteriorly and posteriorly (Fig. 59).

Species of the genus *Pella* are known to be mainly associated with the ant species of the genus *Lasius* (subgenus *Dendrolasius*), and only occasionally with *Crematogaster*, *Formica*, *Liometopum*, and *Tapinoma* (Maruyama, unpublished).

***Pella gesneri* species group**

DIAGNOSIS

Spermatheca with narrowly elongate, sac-shaped capsule bearing ribbing-like microsculpture and without apparent invagination, and with narrow, moderately long, sinuate, and often irregularly twisted posteriorly stem (Figs 30, 40, 43, 46, 51).

4. *Pella gesneri* Klimaszewski

Map 1, Figs 12, 44-46

Pella gesneri Klimaszewski in: Klimaszewski *et al.*, 2005: 29. **Holotype** (male): Canada, New Brunswick, Sudbury Co., Acadia Research Forest, 9.06.1999, pitfall trap, control 3, #570, G. Gesner (LFC).

Paratypes: see Klimaszewski *et al.* (2005: 29).

DIAGNOSIS

Body length 4.2-4.7 mm; subparallel (Fig. 12); head and posterior part of abdomen dark brown to nearly black, remainder of the body reddish-brown (Fig. 12);

integument glossy and forebody with isodiametric microsculpture; pubescence moderately long and dense; punctation of forebody coarse and slightly asperate (Fig. 12); antenna with basal segment as long as the two following segments combined, second segment much smaller than third, four slightly elongate, 5-6 quadrate and 7-10 moderately transverse and more so toward the apex, and the terminal segment as long as the one and a half to about two preceding segments combined (Fig. 12); pronotum strongly transverse, broadest above the middle, approximately shield-shaped with broadly arcuate lateral margins, nearly as broad as the elytra, width/length ratio 1.4 (Fig. 12); elytra nearly twice as broad as the suture and about 1.2 times as long as pronotum (Fig. 12); abdomen with broad laterosternites (Fig. 12); basal segment of metatarsus slightly longer than the two following segments combined. MALE. Tergite eight transverse and broadly arcuate apically (Fig. 45); sternite eight transverse and broadly triangular in shape; median lobe of aedeagus with enlarged bulbous and large crista apicalis, tubus narrowly elongate and arcuate ventrally, internal sac with inconspicuous structures (Fig. 44). FEMALE. Tergite eight transverse and broadly arcuate apically; sternite eight posteriorly broadly triangular in shape; spermatheca with narrowly elongate, sac-shaped capsule and narrow U-formed stem (Fig. 46).

BIONOMICS

Adults were captured in pitfall traps. Some were collected from red spruce dominated forest in New Brunswick. Collecting period: June, July and September.

GEOGRAPHIC DISTRIBUTION (Map 1).

(CANADA: **Alberta**, **Manitoba**, New Brunswick, **Ontario**).

Pella carolinae species group

DIAGNOSIS

Spermatheca with capsule narrowed basally and swollen apically, somewhat club-shaped and bearing deep invagination, stem long and narrow bearing more or less broadened apex (Figs 47, 50, 63).

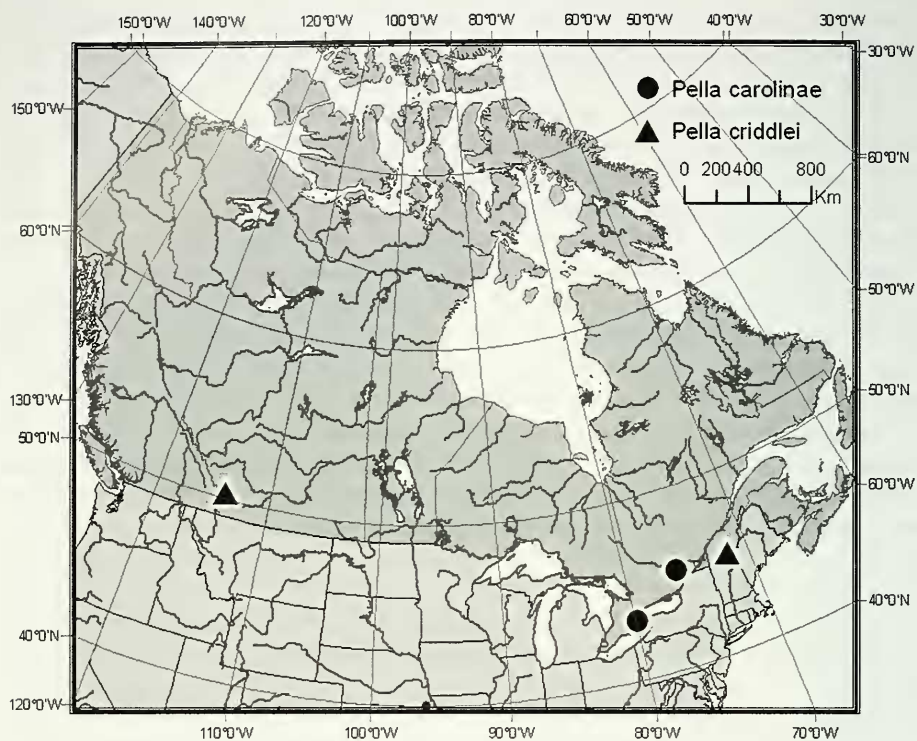
5. *Pella carolinae* (Casey)

Map 2, Figs 14, 47, 61-63

Myrmedonia carolinae Casey 1911: 72. **Syntype** (male): United States, North Carolina, Tryon, Type USNM 39399 (USNM/SEM).

DIAGNOSIS

Body length 3.8-4.0 mm; subparallel (Fig. 14); head and posterior part of abdomen dark brown to nearly black, remainder of the body brown but slightly paler or the entire body approximately uniformly dark brown (Fig. 14); integument glossy and forebody with isodiametric microsculpture; pubescence moderately long and sparse; punctation of forebody fine but slightly asperate on elytra; antenna with basal segment as long as the two following segments combined, second segment much smaller than third, 4-6 elongate and 7-10 quadrate to slightly transverse, and the terminal segment as long as the one and a half to about two preceding segments combined (Fig. 14); pronotum transverse, width/length ratio 1.2, broadest approxi-



MAP 2

Collection localities in Canada of *Pella carolinae* and *P. criddlei*.

mately in apical third, approximately trapezoidal in shape with arcuate lateral margins, distinctly narrower than the elytra (Fig. 14); elytra nearly twice as broad as sutural length, and at suture subequal to length of pronotum (Fig. 14); abdomen with broad laterosternites (Fig. 14); basal segment of metatarsus about as long as the two following segments combined. MALE. Tergite eight transverse and bearing apical serration (Fig. 62); sternite eight transverse and broadly rounded apically; median lobe of aedeagus with enlarged bulbous, tubus narrowly elongate, internal sac with two small subapical vertical structures (Fig. 61). FEMALE. Tergite eight transverse and bearing apical serration like in male; sternite eight transverse and broadly rounded apically; spermatheca with narrowly elongate, sac-shaped and arched capsule and narrow U-formed stem swollen posteriorly (Figs 47, 63).

BIONOMICS

No data is available on the life history of this species. Collecting period: June, August and October.

GEOGRAPHIC DISTRIBUTION (Map 2).

CANADA: Ontario; **UNITED STATES OF AMERICA:** North Carolina.

6. *Pella loricata* (Casey)

Figs 15, 48-50

Myrmedonia loricata Casey, 1893: 322. **Syntypes** (male & female): United States, Ohio, Ross Co., 9.02.74, *loricata* – 2, paratype USNM 39400; Canada, C.W., *loricata* Casey, Type USNM 39400 (USNM/SEM).

Myrmedonia cremastrogastris Wasmann, 1894: 207. **Syntype** (female): United States, Ohio, Ross Co., # 8 (USNM/SEM). **New synonymy**.

DIAGNOSIS

Body length 4.0-4.5 mm; narrowly oval (Fig. 15); lateral portions of elytra and posterior part of abdomen dark brown, remainder of the body reddish-brown or the entire body dark brown to black with lighter three basal tergites (Fig. 15); integument glossy and forebody without apparent microsculpture; pubescence moderately long and sparse; punctation of forebody fine but slightly asperate on elytra; antenna with basal segment as long as the two following segments combined, second segment much smaller than third, four quadrate, 5-10 subquadrate to slightly transverse, and the terminal segment as long as one and a half length of the two preceding segments combined (Fig. 15); pronotum slightly transverse, width/length ratio 1.1, about one fifth broader than long, broadest in apical third, approximately trapezoidal in shape, distinctly narrower than the elytra (Fig. 15); elytra nearly twice as broad as sutural length, and at suture as long as pronotum (Fig. 15); abdomen with broad laterosternites (Fig. 15); basal segment of metatarsus as long as the two following segments combined or slightly longer. **MALE**. Tergite eight transverse, shallowly emarginated medially and bearing apical serration (Fig. 49); sternite eight transverse and broadly rounded apically; median lobe of aedeagus with enlarged bulbus, tubus narrowly elongate and straight laterally, internal sac with membranous structures (Fig. 48). **FEMALE**. Tergite eight and sternite eight similar to those of male; spermatheca with capsule narrow basally and swollen apically, stem strongly sinuate with posterior loop slightly swollen posteriorly (Fig. 50).

BIONOMICS

Several adult specimens were captured from deciduous litter at the edge of a bog, and from under rock with ants. Collecting period: June and July (Ontario) and February (Ohio).

GEOGRAPHIC DISTRIBUTION

CANADA: Ontario; UNITED STATES OF AMERICA: Ohio.

Pella criddlei species group

DIAGNOSIS

Body opaque (Fig. 17), and forebody with strong isodiametric microsculpture; spermatheca with narrowly tubular capsule bearing apical spine-shaped structure and short, more or less straight stem (Fig. 60).

7. *Pella criddlei* (Casey) (**new combination**)

Map 2, Figs 17, 55, 56, 60, 71

Myrmedonia criddlei Casey 1911: 73. **Holotype** (male): Canada, Manitoba, Aweme, N. Criddle, type USNM 39402 (USNM/SEM).

DIAGNOSIS

Body length 3.5-5.0 mm; subparallel; lateral portions of elytra and posterior part of abdomen dark brown, remainder of the body reddish-brown (Fig. 17); integument opaque and forebody with strong isodiametric microsculpture; pubescence fine and short, adhering to integument; forebody with granulation and strongly so on elytra; antenna with basal segment almost as long as the two following segments combined, second segment much smaller than third, four quadrate to slightly elongate, 5-10 slightly to moderately strongly transverse, and the terminal segment about as long as the two preceding segments combined (Fig. 17); pronotum slightly transverse, width/length ratio 1.2, about one fifth broader than long, broadest in apical third, approximately trapezoidal in shape, about one sixth narrower than elytra (Fig. 17); elytra slightly more than twice as broad as sutural length, and at suture shorter than pronotum (Fig. 17); abdomen with broad laterosternites (Fig. 17); basal segment of metatarsus as long as the two following segments combined. MALE. Tergite eight transverse, and truncate apically bearing apical serration and shallow emargination (Fig. 56); sternite eight transverse and broadly rounded apically; median lobe of aedeagus with enlarged bulbus, tubus narrowly elongate and sinuate laterally, internal sac with membranous subapical structures (Fig. 55). FEMALE. Tergite eight and sternite eight similar to those of male; spermatheca L-formed, capsule tubular and slightly arched, bearing apical spur, stem thin and slightly sinuate (Fig. 60).

BIONOMICS

The Quebec specimens were captured in a balsam fir plantation. Collecting period: May through August.

GEOGRAPHIC DISTRIBUTION (Map 2).

CANADA: **Alberta**, Manitoba, **Quebec**.

Pella schmitti species group

DIAGNOSIS

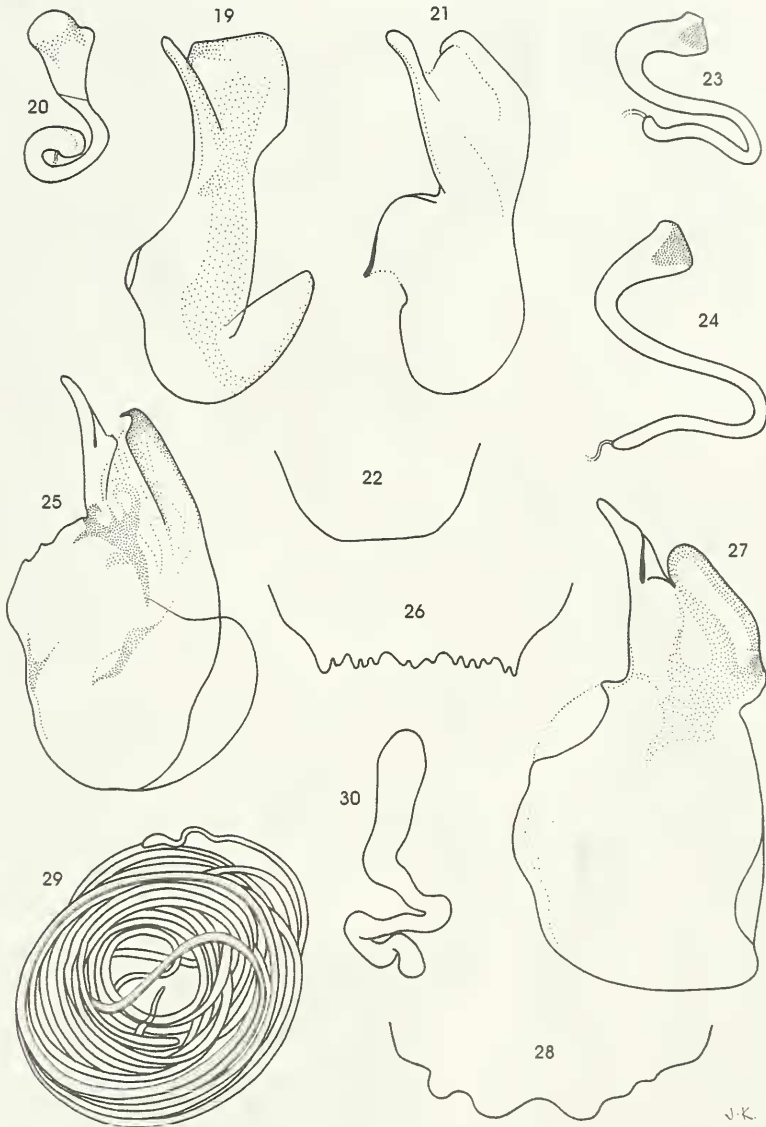
Body extremely broad, pronotum slightly broader than elytra; spermatheca with tubular and U-formed capsule bearing shallow apical invagination and minute posterior projection, stem thin and strongly sinuate anteriorly and posteriorly (Fig. 59).

8. *Pella schmitti* (Hamilton) (new combination) Map 3, Figs 18, 57-59, 72

Myrmedonia schmitti Hamilton, 1895: 346. **Syntypes:** United States, Pennsylvania: type, Carn. Mus. Acc. 349 (CMNH) 1 female; Type, St. Vinc., Carn. Mus. Acc. 349 (CMNH) 1 male; 1 sex undetermined.

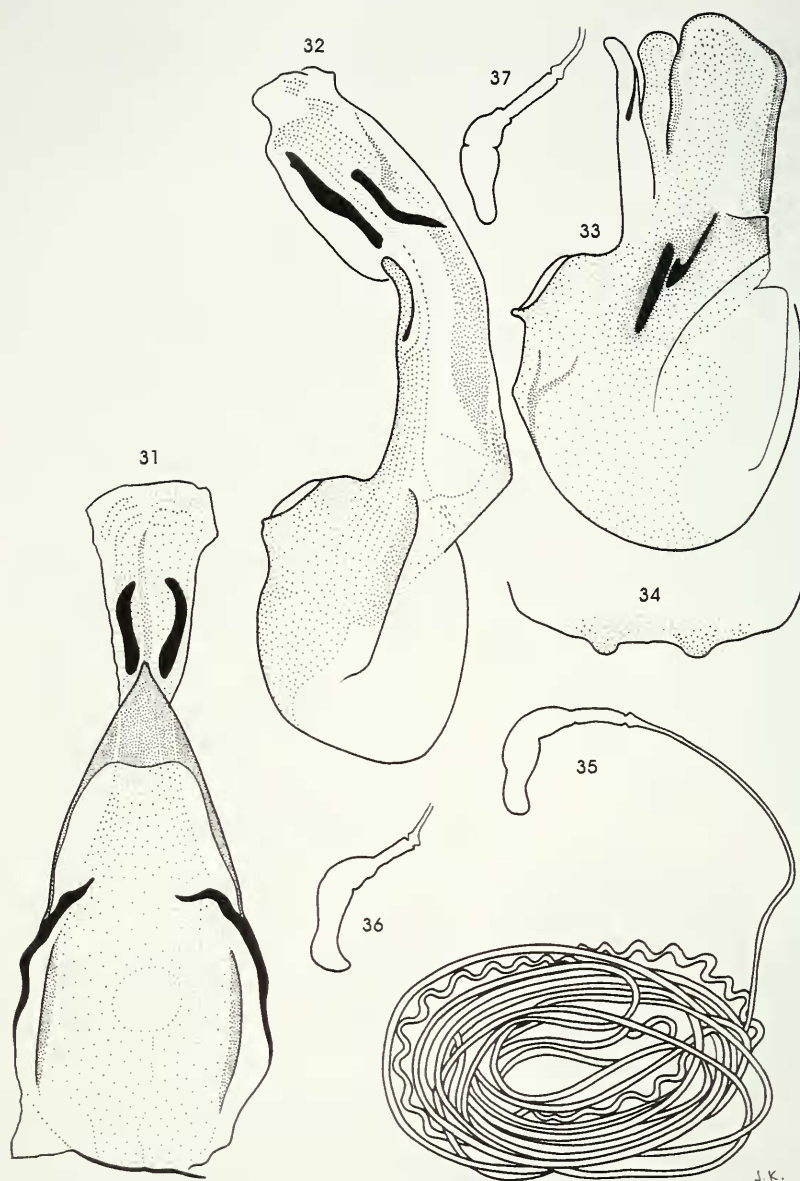
DIAGNOSIS

Body length 4.5-5.0 mm; broad and flattened; head black, remainder of the body brown or brown with rust tinge and postero-lateral parts of elytra with two broad yellowish or whitish-yellow large spots (Fig. 18); integument glossy and forebody with isodiametric microsculpture; pubescence fine, short, and sparse; antenna with basal segment about as long as the two following segments combined, second segment much



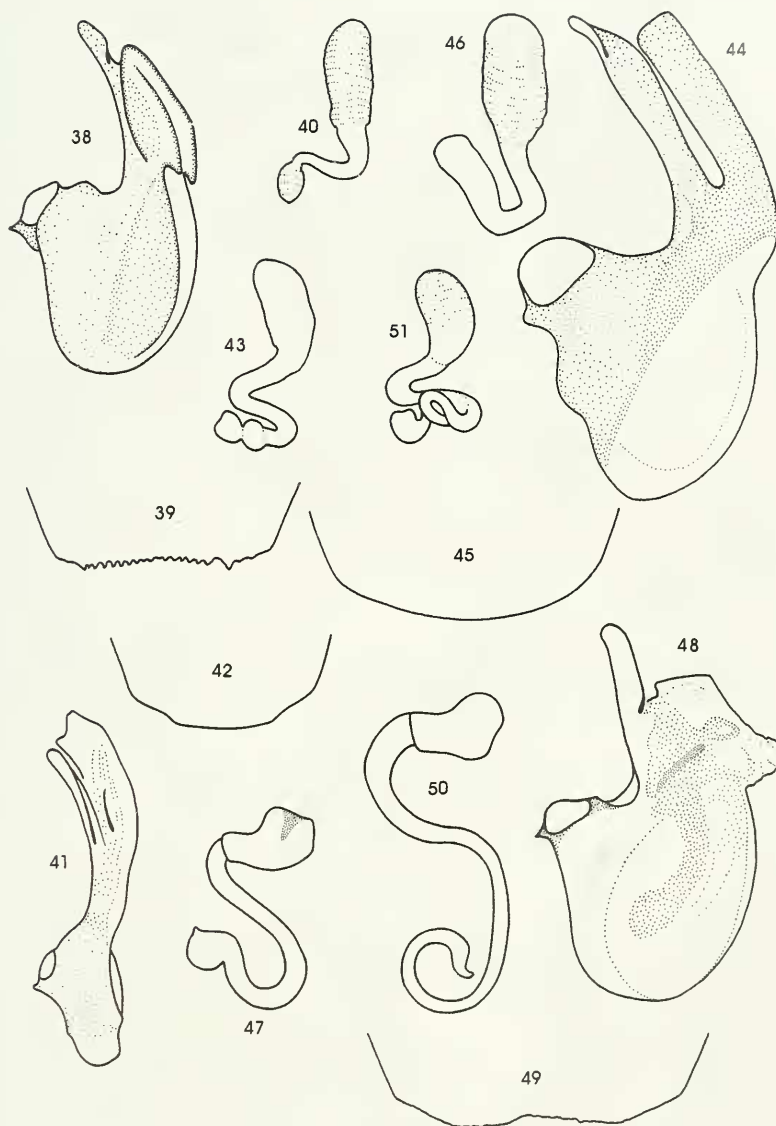
FIGS 19-30

Genital structures of *Apalonia*, *Myrmoecia*, *Zyras* (s. str.), and *Pella*: 19-20, *Apalonia seticornis* Casey: 19, median lobe of aedeagus in lateral view (length 0.2 mm), 20, spermatheca (length 0.2 mm); 21-23, *Myrmoecia lauta* (Casey): 21, median lobe of aedeagus in lateral view (length 0.3 mm), 22, apical part of male tergite eight (length 0.2 mm), 23, spermatheca (length 0.3 mm); 24, *Myrmoecia lugubris* (Casey): spermatheca (length 0.3 mm); 25, 26, *Zyras* (s. str.) *planifer* (Casey): 25, median lobe of aedeagus in lateral view (length 0.3 mm), 26, apical part of male tergite eight (length 0.3 mm); 27-29, *Zyras* (s. str.) *rudis* (LeConte): 27, median lobe of aedeagus in lateral view (length 0.4 mm), 28, apical part of male tergite eight (length 0.3 mm), 29, spermatheca (0.3 mm); 30, *Pella angustula* (Casey): spermatheca (length 0.3 mm).



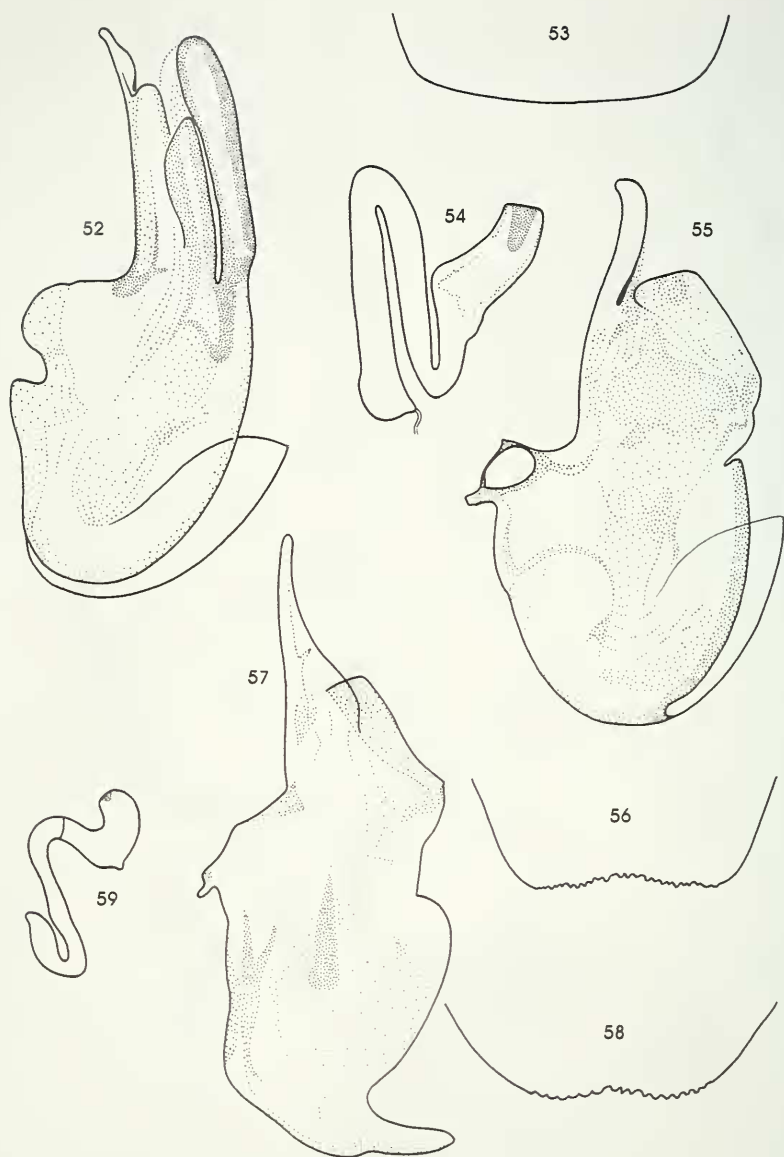
FIGS 31-37

Genital structures of *Zyrras* (s. str.) species: 31-36, *Zyrras* (s. str.) *obliquus* Casey: 31, median lobe of aedeagus in dorsal view with everted internal sac (length 0.9 mm), 32, median lobe of aedeagus in lateral view with everted internal sac (length 0.9 mm), 33, median lobe of aedeagus with inverted internal sac (length 0.8 mm). 34, apical part of male tergite eight (length 0.3 mm), 35, spermatheca with coiled seminal canal (length 0.5 mm), 36, spermatheca without seminal canal (length 0.1 mm); 37, *Zyrras* (s. str.) *haworthi* Stephens, Germany: spermatheca without seminal canal (length 0.1 mm).



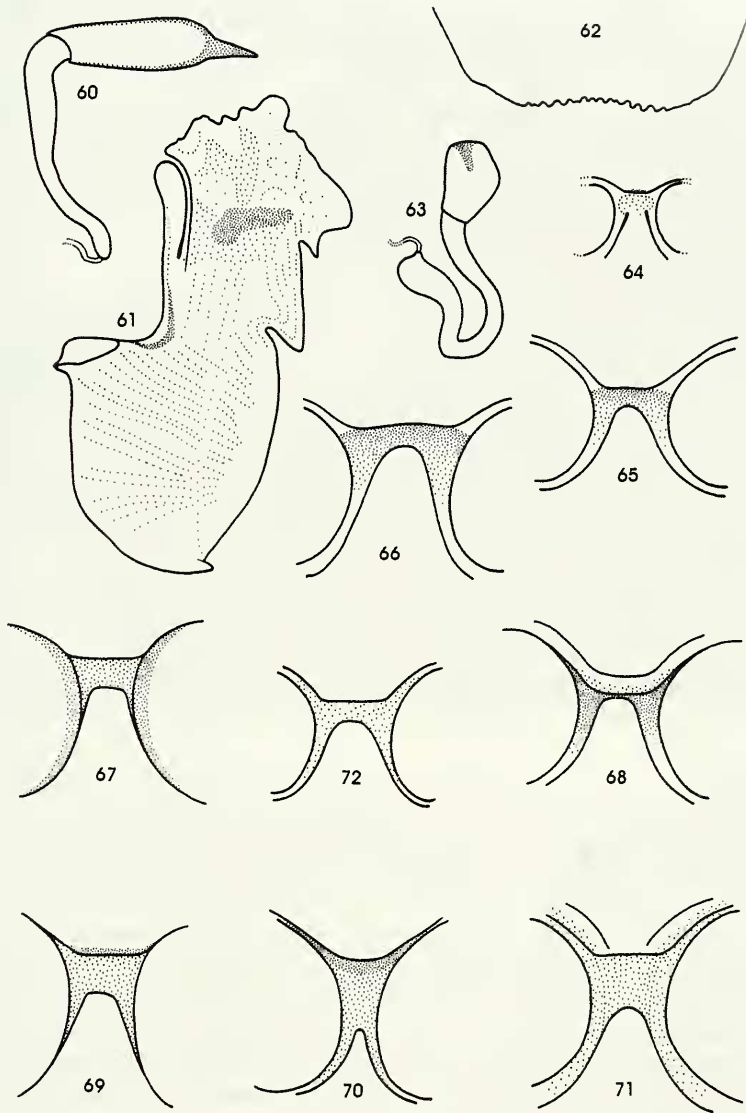
FIGS 38-51

Genital structures of *Pella* species: 38-40, *Pella caliginosa* (Casey): 38, median lobe of aedeagus in lateral view (length 0.3 mm), 39, apical part of male tergite eight (length 0.2 mm), 40, spermatheca (length 0.3 mm); 41-43, *Pella fauveli* (Sharp): 41, median lobe of aedeagus in lateral view (length 0.2 mm), 42, apical part of male tergite eight (length 0.1 mm), 43, spermatheca (length 0.2 mm); 44-46, *Pella gesneri* Klimaszewski: 44, median lobe of aedeagus in lateral view (length 0.8 mm), 45, apical part of male tergite eight (length 0.4 mm), 46, spermatheca (length 0.5 mm); 47, *Pella carolinae* (Casey): spermatheca (length 0.3 mm); 48-50, *Pella loricata* (Casey): 48, median lobe of aedeagus in lateral view (length 0.3 mm), 49, apical part of male tergite eight (length 0.2 mm), 50, spermatheca (length 0.3 mm); 51, *Pella recisa* (Casey): spermatheca (length 0.2 mm).



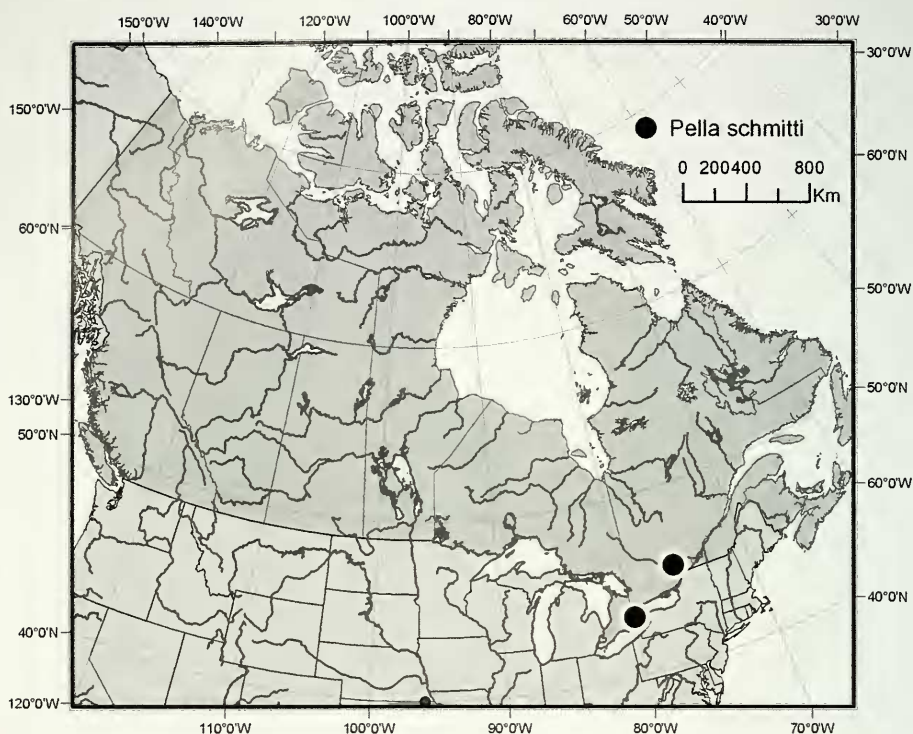
FIGS 52-59

Genital structures of *Platysa* and *Pella* species: 52-54, *Platysa sonomae* Casey: 52, median lobe of aedeagus in lateral view (length 0.9 mm), 53, apical part of male tergite eight (length 0.4 mm), 54, spermatheca (length 0.5 mm); 55, 56, *Pella criddlei* (Casey): 55, median lobe of aedeagus in lateral view (length 0.4 mm), 56, apical part of male tergite eight (length 0.3 mm); 57-59, *Pella schmitti* (Hamilton): 57, median lobe of aedeagus in lateral view (length 0.6 mm), 58, apical part of male tergite eight (length 0.4 mm), 59, spermatheca (length 0.4 mm).



FIGS 60-72

Mesosterna and genital structures of Zyrras group of genera: 60, *Pella criddlei* (Casey): spermatheca (length 0.3 mm); 61-63, *Pella carolinae* (Casey): 61, median lobe of aedeagus in lateral view (length 0.5 mm), 62, apical part of male tergite eight (length 0.3 mm), 63, spermatheca (length 0.3 mm); 64-72, meso- and metasternum of: 64, *Apalonia seticornis* Casey (length 0.2 mm); 65, *Myrmoecia lauta* (Casey) (length 0.3 mm); 66, *Zyrras* (s. str.) *planifer* (Casey) (length 0.3 mm); 67, *Pella angustula* (Casey) (same in *P. recisa* (Casey)) (length 0.3 mm); 68, *Pella caliginosa* (Casey) (length 0.3 mm); 69, *Pella fauveli* (Sharp) (same in *P. loricata* (Casey)) (length 0.2 mm); 70, *Platyusa sonomae* Casey (length 0.4 mm); 71, *Pella criddlei* (Casey) (length 0.3 mm); 72, *Pella schmitti* (Hamilton) (length 0.4 mm).



MAP 3

Collection localities in Canada of *Pella schmitti*.

smaller than third, four slightly elongate, 5-10 strongly transverse with apical ones twice as broad as long, and the terminal segment about as long as the two preceding segments combined (Fig. 18); pronotum broad, shield-shaped, about 1.8-2.0 as broad as long, broadest in basal third, nearly as broad as elytra (Fig. 18); elytra strongly transverse, about three times broader than sutural length, at suture shorter than pronotum (Fig. 18); abdomen with broad laterosternites (Fig. 18); basal segment of metatarsus about as long as the three following segments combined. MALE. Tergite eight strongly transverse, and truncate apically bearing apical serration and shallow emargination (Fig. 58); sternite eight transverse and broadly rounded apically; median lobe of aedeagus with enlarged bulbus, tubus extremely narrow, elongate and nearly straight laterally, internal sac with two basal elongate structures (Fig. 57). FEMALE. Tergite eight strongly transverse and slightly emarginated medially; sternite eight transverse and broadly rounded apically; spermatheca with tubular, U-formed capsule bearing minute median projection and shallow apical invagination, stem thin and strongly sinuate anteriorly and posteriorly (Fig. 59).

BIONOMICS

No life history data are available. Collecting period: July and August.

GEOGRAPHIC DISTRIBUTION (Map 3).

CANADA: Ontario, Quebec; **UNITED STATES OF AMERICA:** Massachusetts, Pennsylvania.

IV. Genus *Platyusa* Casey

Figs 16, 52-54

Platyusa Casey, 1885: 305. **Type species:** *Platyusa sonomae* Casey. Fixed by Casey (1885) by monotypy. **Species included:** *P. sonomae* Casey.

DIAGNOSIS

Body medium-sized, moderately robust and broad, glossy, slightly flattened (Fig. 16); pubescence fine and slightly adhering to the integument but without silky appearance; antenna with basal segment about as long as the two following segments combined, second segment smaller than third, four subquadrate, 5-10 slightly to distinctly transverse and more so toward the apex, and the terminal segment about as long as the two preceding segments combined (Fig. 16); head moderately convex; pronotum slightly impressed medially, broadest about the middle, approximately 1.4 times as broad as long and about as broad as elytra, punctation fine, pubescence directed obliquely posterad along arcuate lines on both sides of the disc and near horizontally at the base of the disc (Fig. 16); abdominal two and three first visible tergites (= actual four and five) without tuberosities; median lobe of aedeagus with enlarged bulbus and elongate tubus (Fig. 52); spermatheca with narrowly elongate, tube-shaped capsule bearing tight ribbings and narrowly elongate invagination, stem broad and Z-formed (Fig. 54).

9. *Platyusa sonomae* Casey

Figs 16, 52-54

Platyusa sonomae Casey, 1885: 305. **Syntypes** (male & female): United States, California, Type USNM 39404; California, *sonomae* - 2, paratype USNM 39404 (USNM/SEM).

DIAGNOSIS

Body length 4.5-5.0 mm; subparallel (Fig. 16); lateral portions of elytra and posterior part of abdomen dark brown, remainder of the body reddish-brown or body uniformly dark brown with reddish elytra, or body entirely dark brown (Fig. 16); integument glossy and forebody with microsculpture; pubescence moderately long and moderately dense; punctation of forebody fine; antenna with basal segment as long as one and a half of the two following segments combined, second segment much smaller than third, four quadrate to slightly transverse, 5-10 slightly to strongly transverse, and the terminal segment as long as one and a half of the two preceding segments length (Fig. 16); pronotum strongly transverse, about 1.4 times as broad as long, broadest about the middle of disc, broadly arcuate laterally, and about as broad as the elytra (Fig. 16); elytra slightly more than twice as broad as sutural length, at suture shorter than pronotum (Fig. 16); abdomen with moderately broad laterosternites (Fig. 16); basal segment of metatarsus as long as the two following segments combined or slightly shorter. **MALE.** Tergite eight transverse, truncate apically (Fig. 53), and bearing numerous macrosetae; sternite eight slightly transverse and broadly rounded apically with numerous apical macrosetae; median lobe of aedeagus with enlarged bulbus,

tubus narrowly elongate and straight laterally, internal sac with folded membranous structures (Fig. 52). FEMALE. Tergite eight and sternite eight similar to those of male; spermatheca with tubular capsule bearing lateral ribbings and a large and long apical invagination, stem Z-formed (Fig. 54).

BIONOMICS

Several specimens were captured in Arizona from altitudes of 7200 feet and one specimen in California from an elevation of 6000 feet. Collecting period: March in California and July in Arizona.

GEOGRAPHIC DISTRIBUTION

CANADA: Ontario; UNITED STATES OF AMERICA: **Arizona, California, Ohio.**

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Appendix 1. Detailed list of specimens examined. Types are listed under each species in the text. All names of provinces and states in bold.

1. *Myrmoecea lauta*

Material examined. CANADA: **Ontario**: Almonte, 22-29.VII.1986, attracted with hexanal, alvar habitat, L. LeSage (CNC) 1 sex? Hamilton, 14-19.VII.1981, M. Sandborn (CNC) 1 sex? UNITED STATES OF AMERICA: **Maine**: Somerset Co., 44°594'N, 69°699'W, 15.XI.1982, R.E. Nelson (CNC) 1 sex?

2. *Zyras* (s. str.) *obliquus*

Material examined: CANADA, **Alberta**: Sibbald Flats Recreation Area, 11.V-15.VI.1984, lodgepole pine/aspen forest, R. Anderson (NHMG) 1 sex? Peace River, 8 km North Warrensville, Twp. 85, Rge. 24, Sec. 26, W. 5, 7-21.VII.1992, PR-C pit-trap, B. Wynes (NoFC) 1 sex? Lac La Biche, 20-30 km East Touchwood Lake Road, UTM 12 4695 60785, 12-26.VII.95, Modified Window Trap, M2-S1-1-1, J. Hammond (NoFC) 1 sex? Lac La Biche, 20-30 km East Touchwood Lake Road, UTM 12 4695 60785, 13-27.VII.95, Modified Window Trap, M2-S1-3-1, J. Hammond (NoFC) 1 sex? La Butte Creek, Wildland Provincial Park, rock outcrop 1 km North La Butte Creek, at Slave River, 59.42504° N, 111.44036°W, open *Pinus banksiana*/*Picea* sp., 6-11.VII.2001, pitfall trap, G.R. Pohl (NoFC) 1 sex? La Butte Creek, Wildland Provincial Park, La Butte Creek at Slave River, 59.42126° N, 111.44612°W, *Populus* sp./*Salix* sp./*Alnus* sp. forest, 5-10.VII.2001, pitfall trap, G.R. Pohl (NoFC) 1 sex? 19 km North Brocket, 49° 43' N, 113° 45' W, 1410 m, 10-15.VI.1998, pantrap, K. White (NoFC) 1 sex? Waiparous, 27.VI.1954, lot 1, B.F. & J.L. Carr (LFC) 12 sex? (NHMG) 2 sex? Waiparous, 4.VII.1954, lot 1, B.F. & J.L. Carr (LFC) 3 sex? **British Columbia**: Upper Carmanah Valley, UTM: 10UCJ 803006, 16.VII-30.VII.1991, TZ.MT1, N. Winchester (LFC) 1 female; Fort St. James, 16.VI.1997, interior Douglas-fir, 4-5 years post-harvest, GP 13 km S, C. Small (UBC) 1 male; same data except: 25.06.1997, Tachie Hill (UBC) 1 female; 15.VII.1997, CP 123 (TFL 42), R. Felix (LFC) 1 male; 21.07.1997, Railway NW (UBC) 1 male; 31.VII.1997, 3 years post-harvest, M. Cloet (UBC) 1 female. **Manitoba**: South Indian Lake, 100 mi N.N.W. Thompson, 20.VII.1977, M. Collins (CNC) 2 sex? **Ontario**: 22 mi South Pickle Lake, 20.VI.1973, Campbell & Carry (CNC) 1 sex? **Quebec**: Longue-Pointe, Sag., 28.VIII.1982, C. Chantal (CNC) 1 sex? Charlevoix Co., Petite Rivière Malbaie 1, 47° 43' N, 70° 46' W, Parc des Grands-Jardins, 22.VII-29.VII.2003, C. Hébert (LFC) 1 sex? Ruis.Blanchet, 49° 04' 00, 64° 45' 30, 28.VI-8.VII.1998, FL V3, old balsam fir forest (LFC) 3 sex? UNITED STATES: **New Hampshire**: Mt. Washington, summit, 29.VII.1957, Becker, Munroe & Mason (CNC) 1 sex? **Oregon**: Mt. Hood, N. F. Timberline Lodge, Clackamas Co., 7000', 31.VII.1979, J.M. and J.M. Campbell (CNC) 1 male, 1 female.

3. *Zyras* (s. str.) *rudis*

Material examined: UNITED STATES OF AMERICA: **Arizona**, Graham Co., Aravaipa Canyon, 900 m, 25.VII.1976, at light, J.M. Campbell (CNC) 1 sex?

4. *Pella fauveli*

Material examined: UNITED STATES OF AMERICA: **California**: San Diego Co., 10.IV.1953, El Cajon, E 27 (CNC) 2 sex? San Diego Co., 26.VI.1956, El Cajon (CNC) 5 sex? Riverside Co., 20.IX.1958, I. Moore (CNC) 2 sex? MEXICO: **Baja California**: 14.III.1958, E. Mayor (CNC) 1 sex?

5. *Pella gesneri*

Material examined: CANADA: **Alberta**: Canmore, 12.VI.1954, lot 1, B.F. & J.L. Carr (LFC) 1 male; Tp. 15, Rge. 14, W. 4 Mer. Alberta, 9.V.1980, lot 3, B.F. & J.L. Carr (MHNG) 1 male, 1 sex? Tp. 24, Rge. 5, W. 5 Mer. Alberta, 26.V.1963, lot 1, B.F. & J.L. Carr (LFC) 1 sex? **Manitoba**: Glenlea, 10 mi South Winnipeg, 31.V-20.VI.1973, J. Redner & C. Starr (CNC) 1 male; 1 mi West Elm Creek, 1.VI-19.VI.1973, J. Redner & C. Starr (CNC) 1 male. **Ontario**: Bell's Corners, 7.VI.1956, S.D. Hicks (CNC) 1 male.

6. *Pella carolinae*

Material examined: CANADA, **Ontario:** Carleton Co., South March, 8.X.1967, A. Smetana (CNC) 1 sex? Hamilton, 7.VI.1981, M. Sandborne (CNC) 2 females, Hamilton, 10-23.VIII.1982, M. Sandborne (CNC) 1 male.

7. *Pella criddlei*

Material examined: CANADA, **Alberta:** Tp. 16, Rge. 29, W 4 Mer. Alberta, 30.IV.1961, lot 1, B.F. & J.L. Carr (LFC) 1 female. **Quebec:** Compton Co., Sawyerville, SAB, Luminoc trap, 25.V.1995, 30.V.1995, 31.V.1995, 29.VI.1995, 13.VII.1995, 5.VIII.1996, Balsam fir plantation (LFC) 1 male, 4 females, (NHMG) 1 sex?

8. *Pella schmitti*

Material examined: CANADA, **Ontario:** Hamilton, 30.VI-8.VII.1981, 20.VII.1980, 14-19.VII.1982, 14-26.VII.1982, 2-7.VIII.1980, 10-23.VIII.1982, 14-22.VIII.1981, 28.VI-II.1980, 23.VIII-5.IX.1982, M. Sanborne (CNC) 39 sex? **Quebec:** Gatineau Park, King Mountain, 14.IV.1968, A. Smetana (CNC) 1 sex? Montreal, 29.VIII.1972, E.J. Kiteley (CNC) 1 sex? UNITED STATES OF AMERICA: Massachusetts: Framingham, 1.VIII.1938, C.A. Frost (CNC) 2 sex?

9. *Platyusa sonomae*

Material examined: UNITED STATES OF AMERICA, **Arizona:** Graham Co., Pinaleno Mts., Turkey Flat, 7200 feet, 27.VII.69, A. Smetana (CNC) 3 males, 6 sex? Apache Co., Chuska Mts., 2250 m, Wagonwheel Campground, 12.VII.1976, J.M. Campbell (CNC) 1 sex? **California:** San Diego Co., Cleveland N.F., Mt. Laguna 6000 feet, 1.III.1983, A. Smetana (CNC) 1 sex?